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DAVID W. TAYLOR NAVAL SHIP RESEARCH
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NOVEMBER 1976

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Bethesda, Md. 20084

QUICK:
A SIMULATION MODEL FOR THE NAVY QUICK TRANS SYSTEM
USER'S MANUAL

by

Raymond E. Nelson

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COMPUTATION AND MATHEMATICS DEPARTMENT
RESEARCH AND DEVELOPMENT REPORT

QUICK: A SIMULATION MODEL FOR THE NAVY QUICK TRANS SYSTEM USER'S MANUAL

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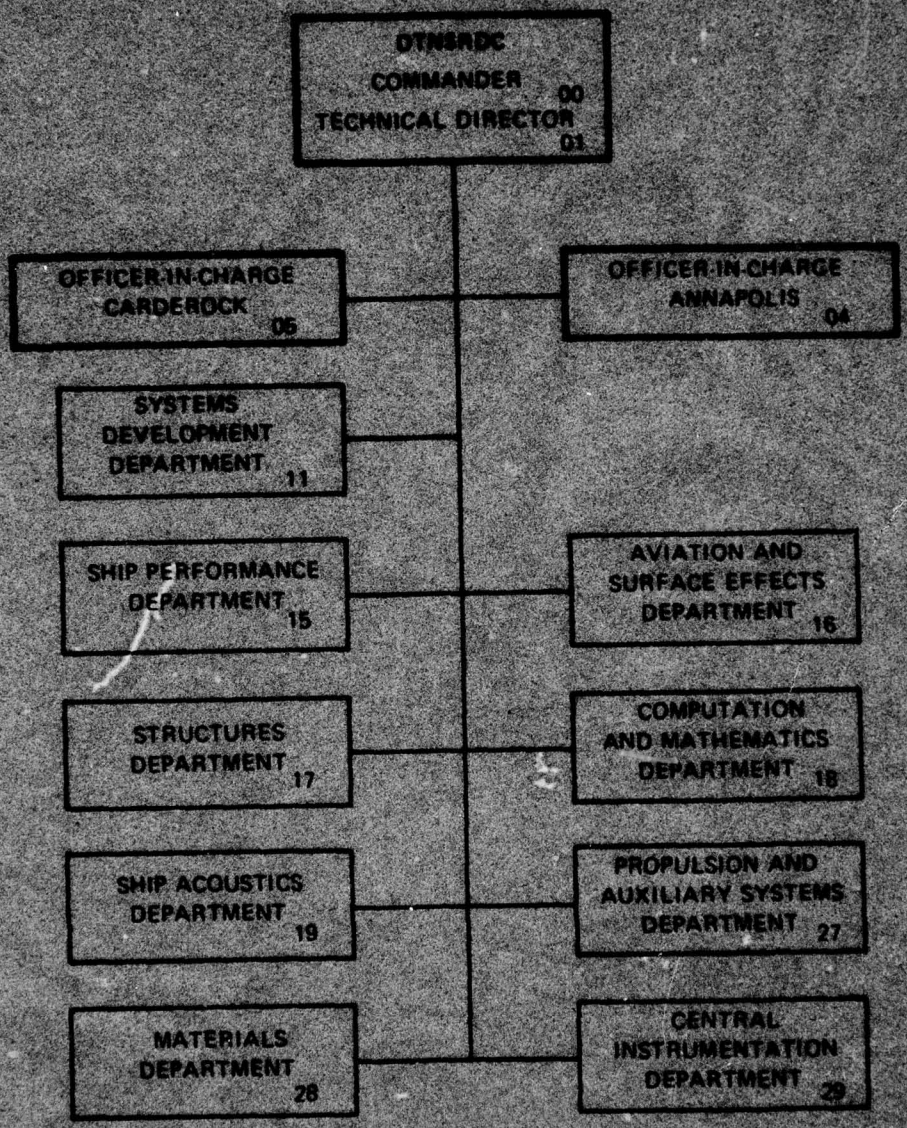

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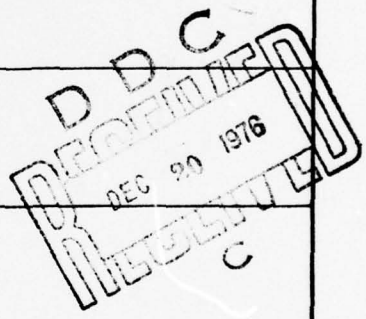

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

QUICKTRANS, computerized simulation, cargo, load factors

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

QUAM, the acronym for QUICKTRANS Airlift Model, is a computerized simulation of the Naval Quick Response Transportion System (QUICKTRANS) developed to permit forecasting of system operating costs, vehicle utilization, and route scheduling load factors for proposed routes and vehicles.

This simulation, written in FORTRAN IV, accepts (as input data) terminals, routes, cargo quantities, numbers of vehicles by type, and unit

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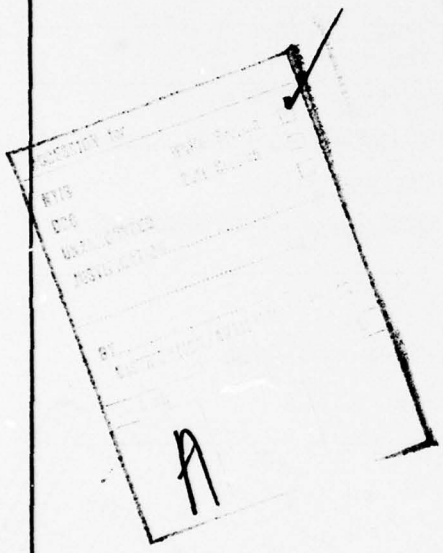
costs. The execution routines compute the time-distance-tonnage relationships for the stated input data to establish cargo loaded, transloaded, and off-loaded at each terminal; utilization for both vehicles (by type) and routes; costs per ton-mile, ton-milage, and both route and system operating costs. The output can provide the entire histographic record and/or management summaries in desired formats for information at terminals, along route segments, routes and for the entire system.

The simulation has been used in the analysis of the requirements for servicing an expanded QUICKTRANS network.

This report describes the model's logic elements and all the inputs needed by QUAM.



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1. INTRODUCTION

1.1 BACKGROUND

QUICKTRANS[1] is the Navy air-truck transportation network, designed to provide a controlled, flexible, and responsive means of transporting urgently required cargo between terminals of major Navy interest within the continental United States (CONUS). The goal of the QUICKTRANS transport facility is to move high priority cargo between any two QUICKTRANS terminals in a time interval no greater than 48 hours. The QUICKTRANS transportation system utilizes both air and truck transport units and operates daily on predetermined time schedules and routes between commercial and military terminals.

Currently the information required to develop the QUICKTRANS route structure is computed manually at considerable expense in manpower and time. A need has thus existed for a more efficient and reliable method of determining QUICKTRANS route patterns and airlift requirements information for planning purposes. Accordingly, a simulation model, QUAM, has been developed to provide a computer-based approach to facilitate and reduce the time required for these calculations.

The QUICKTRANS system model has, since its development, been exercised for the sponsor, NAVSUP 052, for 1) purposes of debugging, orientation, and familiarization, 2) determining the management summary formats and their utility, 3) extending their in-house route analysis capabilities, and 4) forecasting their capabilities in meeting projected demands in FY 76 and 77.

1.2 PURPOSE

The QUICKTRANS Airlift Model (QUAM), a simulation model written in FORTRAN IV, depicts CONUS theater of operation. It is designed to forecast the QUICKTRANS system's cost, vehicle utilization, and route/schedule

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[1] "United States QUICKTRANS Airfreight System, STANDARD OPERATING PROCEDURES." Naval Systems Command, NAVSUP Publication 387, July 1971.

load factors for proposed routes, and transport units or vehicles. The goal of QUAM is to produce a more efficient and economical route-planning and vehicle-selection system. By employing QUAM, the analyst may predict the efficiency of route patterns and, in particular, route and segment load factors, cost per carried ton of cargo, cost per carried ton/mile of cargo, and utilization of vehicles.

1.3 METHOD

The solution to simulating the operation of QUICKTRANS for planning purposes may be approached in many ways. Because of the fixed route segment structure of QUICKTRANS, a static accumulation method was selected for this study.

Since the cargo flow is given with respect to origin and destination terminals and their related transload terminals, and the proposed route structure consists of flow patterns between terminals, the task of selecting routes and vehicles reduces to a comparison of available segment transport space and cargo space required. Cargo/route assignment is made with respect to the cargo delivery flow patterns and the number of route segments used to move cargo from its origin to destination terminals. Direct cargo movement from origin to destination terminals is considered first and remaining cargo movements are ordered by increasing number of transloads needed for delivery.

The projected cargo flow patterns are determined from historic cargo load data collected by the QUICKTRANS Center, Norfolk, Virginia, and analyzed and edited by the Logistics Group at DTNSRDC.

QUAM describes the nodes (terminals) and links (segments) within the QUICKTRANS system and is able to accommodate several types of planning problems. It incorporates node distance tables. Time-distance-tonnage relationships are computed for specified input and are presented in segment/management summaries.

The input data include node linkages (segments), routes (sequential aggregations of segments), vehicle characteristics and their numbers, nodes (terminals) and their characteristics, cargo quantitites, transload points, and unit costs.

Execution of this simulation computes: the amount of cargo on-loaded, transloaded, and off-loaded at each node along every route; costs for cargo movement and handling; and the percentage of each vehicle's cargo capacity used along each route segment. The items calculated include vehicle load factors; cargo throughput at nodes, along segments and routes; ton-mileage figures; cost per ton-mile; and average distance of moved cargo (miles). Table 1 gives terminals currently considered by QUICKTRANS.

Costs computed by the model are of two types, terminal and travel. Travel cost is determined from the cost in dollars per statute mile for a given vehicle type multiplied by the distance traveled (in statute miles). Terminal costs include all expenses incurred by the vehicle while at the terminal; i.e., entry fees, vehicle-servicing charges, and cargo-handling costs.

TABLE 1 - QUICKTRANS TERMINALS

Program ID Number	Terminal Name	Transport Code Name
1	Quonset Point	NCO
2	Wilmington	ILG
3	Patuxent River	NHK
4	Norfolk	NGU
5	Charleston	CHS
6	Jacksonville	NIP
7	Patrick AFB	COF
8	MacDill AFB	MCF
9	Key West	NQX
10	Pensacola	NPA
11	Dallas	NBF
12	Indianapolis	IND
13	San Diego	NZY
14	Point Mugu	NTD
15	Lemoore	NLC
16	Alameda	NGZ
17	Paine Field	PAE
18	Boston	BOS
19	Philadelphia	PHL
20	McGuire	WRI
21	Dover	DOV
22	Washington, D.C.	DCA
23	Cherry Point	NKT
24	Albany	NAB
25	Corpus Christi	NGP
26	Long Beach	LGR
27	Travis AFB	SUU
28	McChord AFB	TCM
29	Whidbey Island	NUW
30	Bremerton	PWT

TABLE 1 - QUICKTRANS TERMINALS (Continued)

Program ID Number	Terminal Name	Transport Code Name
31	Atlanta	ATL
32	Red River	TXK
33	Tinker	OKC
34	Pueblo	PUB
35	Toole	SLC
36	Umatilla	PDT

2. DESCRIPTION OF INPUT DATA

2.1 DESCRIPTION OF INPUT CARDS

2.1.1 Identification Card (IDENT)

IDENT gives the computer run identification information. Its format is alpha-numeric, and it may have 1 to 27 characters.

2.1.2 General Information Card (GEN)

GEN gives the limits of variables to be input and the control constants.

NTERM	NROUTE	NITIN	NKGOGN	NVAT	CLAND	CCONVF	TCOST	ADJT	IT	
1 5	6 10	11 15	16 20	21 25	26 35	36 45	46 55	56 65	66 68	69 80

Variable	Format	Description
NTERM	I5	Number of terminals in simulation (1 to 99).
NROUTE	I5	Number of routes (1 to 40).
NITIN	I5	Number of itineraries, i.e., list of terminal numbers given in order of vehicle encounter. Used with route information (1 to 40).
NKGOGN	I5	Number of cargo flow entries (1 to 3000).
NVAT	I5	Number of vehicle types (1 to 9).
CLAND	F10.2	Cost ($) per aircraft landing.
CCONVF	F10.2	Conversation factor, lb/cu ft of cargo.
TCOST	F10.2	Total terminal cost ($).
ADJT	I2	Aircraft cost adjustment factor.
IT		Cargo flow table indicator; IT = 1, Table printed.

2.1.3 Terminal Code Cards (TERM)

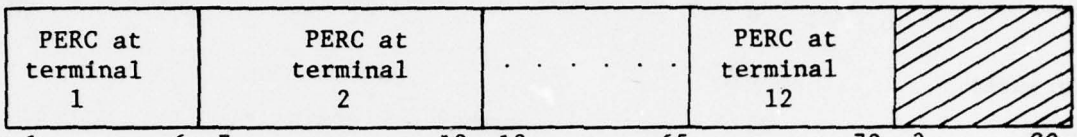
The TERM cards give the three-letter transportation code for each terminal considered.

	CODE 1		CODE 2	. . . . .		CODE 18	
1 2	4 5	6	8		69 70	72	73 80

Variable	Format	Description
CODE 1-CODE "NTERM"	18A4	Three-letter terminal code.

2.1.4 Cargo Modification Card (PERC).

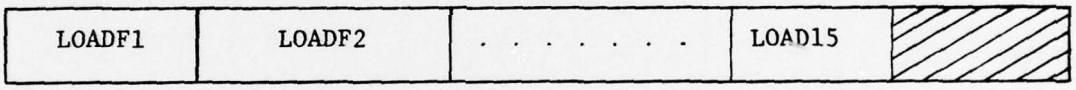
The PERC cards adjust the amount of cargo generated at each terminal without changing the original cargo generation input data. PERC gives the percent of increase or decrease of cargo originating at a given terminal. If there are no changes, cards are blank.



Variable	Format	Description
PERC at terminal 1 to 99	12F6.0	Percent of increase or decrease of cargo at each originating terminal.

2.1.5 Load Factor Format Cards (CAPV).

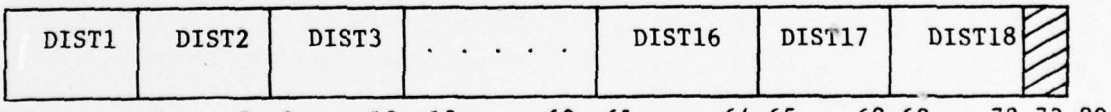
The CAPV cards give the maximum load factor allowed for each route.



Variable	Format	Description
LOADF1 ... LOADF40 for routes 1 to 40	15F5.0	Maximum load factor for each route

2.1.6 Distance Table Cards (DIST)

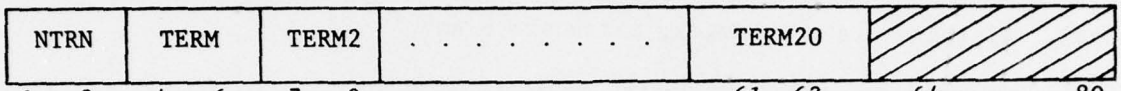
The DIST cards give the distance in miles between terminals. DIST cards contain packed data, three data items per word.



Variable	Format	Description
DIST1,...,DIST99	6112	Distance in miles between terminals

2.1.7 Itinerary Cards (ITN)

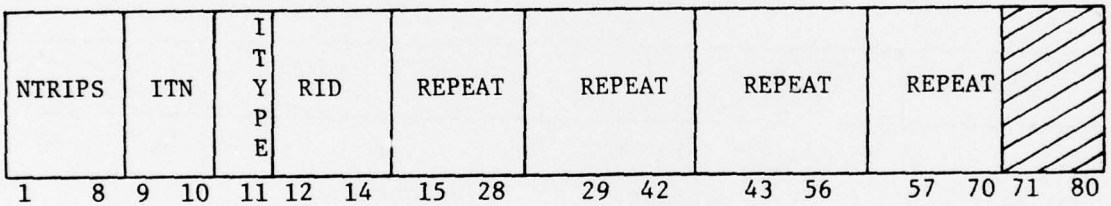
The ITN cards give the terminals in order of encounter to be serviced on a route. The maximum number of terminals on a given itinerary is 20.



Variable	Format	Description
NTRN	I3	Number of terminals on this itinerary.
TERM1,...,TERM20	20I3	Terminals on itinerary in order of encounter.

2.1.8 Route Cards (RTE)

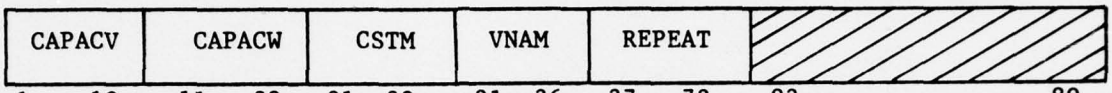
The RTE cards give all information necessary to describe the routes. The maximum number of routes is 40.



Variable	Format	Description
NTRIPS	I10	Number of trips vehicle to make on the route in the time period considered. Decimal representation ΔΔΔΔΔΔ.ΔΔ
ITN	I2	Itinerary number.
ITYPE	I1	Vehicle type
RID	I3	Route identification number.

2.1.9 Vehicle Cards (VEH)

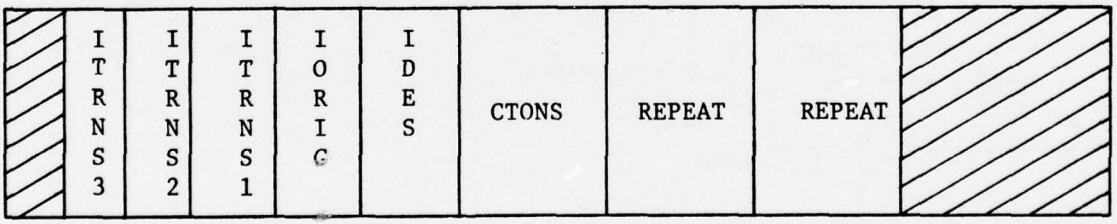
The VEH cards give all information necessary to describe lift capabilities of each vehicle. The maximum number of vehicle types allowed is 9.



Variable	Format	Description
CAPACV	F10.0	Usable space in cu ft
CAPACW	F10.0	Maximum weight in lb
CSTM	F10.0	Cost per mile to operate vehicle, $/mi
VNAM	A6	Vehicle description name. If vehicle is a truck, "TRUCK" must appear in this field.

2.1.10 Cargo Flow Cards (CARG)

The CARG cards give the quantity of cargo to be shipped from a generation (origin) terminal and delivered at a destination terminal. CARG cards also specify all terminals at which the cargo is to change routes. These terminals are defined as transload terminals. The maximum number of cargo generations allowed is 1000.



Variable	Format	Description
ITRNS1-ITRNS3	3I2	Transload terminals in order of encounter
IORIG	I2	Originating terminal
IDES	I2	Final destination terminal
CTONS	F8.2	Tons of cargo to be shipped

2.2 SAMPLE INPUT DECK SETUP

Figure 1 shows arrangement of the input deck.

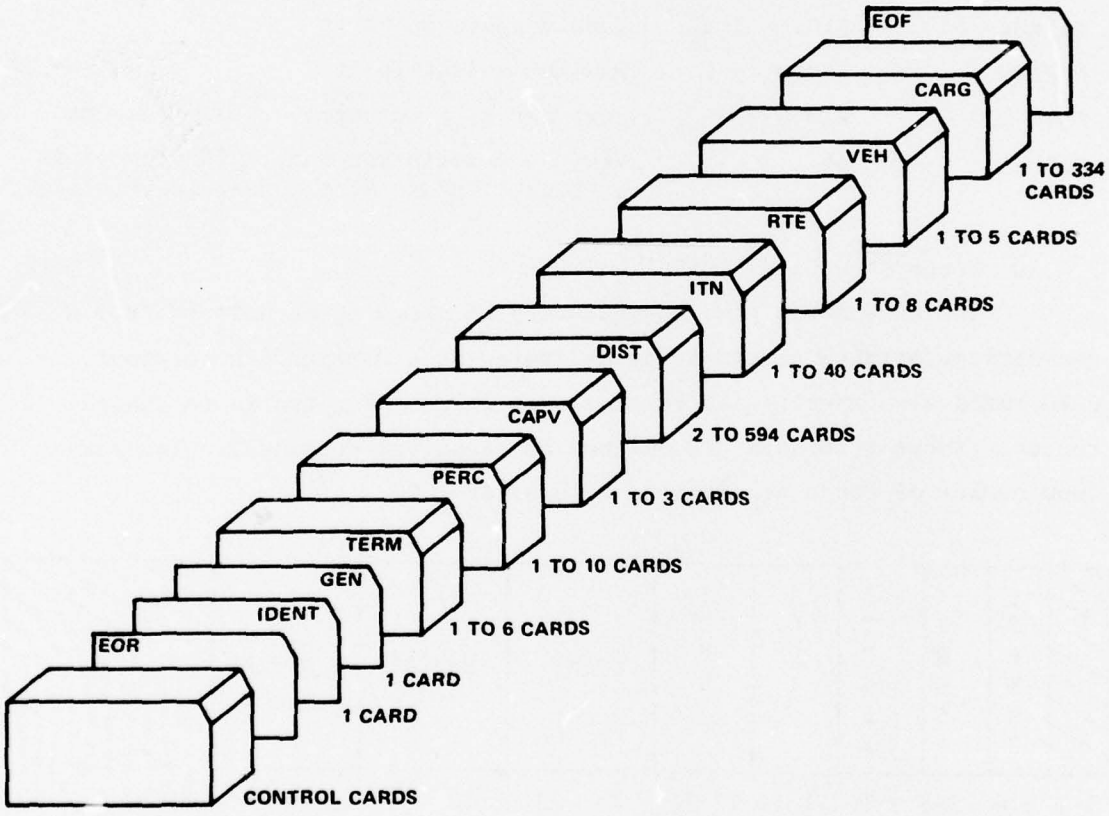


Figure 1 - Input Deck Setup

3. OUTPUT

QUAM output consists of the following parts:

(a) Cargo flow table

(b) Routing Error trace - gives all entries in the cargo flow table for which routing from origin to destination terminals cannot be accomplished.

(c) System Cargo Summary

(d) Segment Operations Summary - (columns given as "ton/miles Overflow Upon Departure" and "Pounds Overflow Upon Departure" give ton/miles and pounds of cargo assigned to route in excess of an 80% load factor).

(e) Aircraft Management Summary

(f) Truck Management Summary

(g) Overall Management Summary

(h) Cargo Movement Diagnostics - specifies computer representation of incomplete cargo shipment.

4. COMPUTER SYSTEM INFORMATION

QUAM is written in FORTRAN IV to run on the CDC 6600 computer. Average running time is 9 seconds CPU time at a cost of $3.00 per run. QUAM has been expanded to consider a maximum of 99 terminals and 40 routes. If the above variable limits are reduced to an average QUICKTRANS case of 20 terminals and 10 routes, core allocation can be reduced to 60K.

APPENDIX A

PROGRAM LISTING

```
      PROGRAM QUAM (INPUT,OUTPUT,TAPE5=INPUT,TAPE6= OUTPUT,TAPE7)        QAM    5
     DIMENSION ITNAM(99),IDIST(99,33),CAPACV(9),CAPACW(9),CSTR(9),       QAM   10
    1 NPITIN(40),NPITN1(40,20)                        ,IROUTE(40),       QAM   15
    2 KGOGN1(7000),CGOGN2(7000),CGOGN3(7000),ISEG(40,19,2),SEGA(40,19),QAM   20
    3 SEGU(40,19) ,SHTP(99),GEN(99),DEL(99),TRANS(99)  ,JSEG(40,19,3)   QAM   25
    5,IDRUN(12)  ,VNAM(9),VEH(2)                                        QAM   30
    4,RMI(40),TMAV(40),TMUS(40),TEMP(9)       ,STAN(99),TOT(10),US(99)  QAM   35
    6,VEHS(9,8),VSUMC(9)     ,CAPCV(40)  ,PERIC(99),CR(9)               QAM   40
     DATA VEH/6HAIRCRF,6HTRUCK  /                                       QAM   45
      READ(5,7777) IDRUN                                                QAM   50
7777 FORMAT(12A6)                                                       QAM   55
      READ(5,1000) NTERM,NROUTE,NITIN,NKGOGN,NVAT,CLAND,CCONVF,         QAM   60
    1 TCOST,ADJT,IT                                                     QAM   65
1000 FORMAT(5I5,4F10.2,I2)                                              QAM   70
      READ(5,1001) (ITNAM(I),I=1,NTERM)                                 QAM   75
1001 FORMAT(18A4)                                                       QAM   80
     READ(5,1007) (PERIC(I),I=1,NTERM)                                  QAM   85
1007 FORMAT(12F6.0)                                                     QAM   90
      READ(5,1999) (CAPCV(I),I=1,NROUTE)                                QAM   95
1999 FORMAT(15F5.0)                                                     QAM  100
     IC=FLOAT(NTERM)/3.+.9                                              QAM  105
     DO 10 I=1,NTERM                                                    QAM  110
  10 READ(5,1002) (IDIST(I,J),J=1,IC)                                   QAM  115
1002 FORMAT(6I12,8X)                                                    QAM  120
     READ(5,1003) (NPITIN(I),(NPITN1(I,J),J=1,20),I=1,NITIN)            QAM  125
1003 FORMAT(21I3,17X)                                                   QAM  130
      READ(5,1004) (IROUTE(I),I=1,NROUTE)                               QAM  135
1004 FORMAT(5I14,10X)                                                   QAM  140
     READ(5,1005) (CAPACV(I),CAPACW(I),CSTR(I),VNAM(I),I=1,NVAT)        QAM  145
1005 FORMAT(2(3F10.0,A6))                                               QAM  150
     READ(5,1006) (KGOGN1(I),CGOGN2(I),I=1,NKGOGN)                      QAM  155
1006 FORMAT(3(I14,F8.2))                                                QAM  160
     DO 242 I=1,NKGOGN                                                  QAM  165
     IORIG=MOD(KGOGN1(I)/100,100)                                       QAM  170
 242 CGOGN2(I)=CGOGN2(I)+PERIC(IORIG)*CGOGN2(I)                         QAM  175
     IF(IT.EQ.1) CALL TABLE(NTERM,ITNAM,NKGOGN,KGOGN1,CGOGN2,IDENT)     QAM  180
     CALL LINKS(NITIN, NKGOGN,NPITIN,NPITN1,KGOGN1,ITNAM)               QAM  185
      ICOUNT=0                                                          QAM  190
      DO 240 K=1,NKGOGN                                                 QAM  195
     IORIG=MOD(KGOGN1(K)/100,100)                                       QAM  200
      CGOGN3(K)=(CGOGN2(K)*2000.)/CCONVF                                QAM  205
      CGEN=CGEN+CGOGN3(K)                                               QAM  210
      GEN(IORIG)=GEN(IORIG)+CGOGN3(K)                                   QAM  215
      IDES=MOD(KGOGN1(K),100)                                           QAM  220
     IDES1=MOD(KGOGN1(K)/10000,100)                                     QAM  225
     IDES2=MOD(KGOGN1(K)/1000000,100)                                   QAM  230
     IDES3=MOD(KGOGN1(K)/10**8,100)                                     QAM  235
      IF(IDES1.LE.0) GO TO 240                                          QAM  240
      IF(IDES2. NE.0) GO TO 241                                         QAM  245
      ICOUNT=ICOUNT+1                                                   QAM  250
      KGOGN1(NKGOGN+ICOUNT)=10000000000+IDES+IDES1*100000000            QAM  255
       CGOGN3(NKGOGN+ICOUNT)=CGOGN3(K)                                  QAM  260
      GO TO 240                                                         QAM  265
 241 IF(IDES3.NE.0) GO TO 141                                           QAM  270
```

```
      ICOUNT=ICOUNT+1                                                    QAM  275
       KGOGN1(NKGOGN+ICOUNT)=10000000000+IDES1*100000000+IDES2*10000     QAM  280
       CGOGN3(NKGOGN+ICOUNT)=CGOGN3(K)                                   QAM  285
       ICOUNT=ICOUNT+1                                                   QAM  290
        KGOGN1(NKGOGN+ICOUNT)=IDES+IDES2*100000000                       QAM  295
       CGOGN3(NKGOGN+ICOUNT)=CGOGN3(K)                                   QAM  300
      GO TO 240                                                          QAM  305
  141 KGOGN1(K)=MOD(KGOGN1(K),1000000)                                   QAM  310
      ICOUNT=ICOUNT+1                                                    QAM  315
      KGOGN1(NKGOGN+ICOUNT)=10**10+IDES1*10**8+IDES2*10000               QAM  320
       CGOGN3(NKGOGN+ICOUNT)=CGOGN3(K)                                   QAM  325
      ICOUNT=ICOUNT+1                                                    QAM  330
      KGOGN1(NKGOGN+ICOUNT)=IDES2*10**8+IDES3*10000                      QAM  335
       CGOGN3(NKGOGN+ICOUNT)=CGOGN3(K)                                   QAM  340
      ICOUNT=ICOUNT+1                                                    QAM  345
      KGOGN1(NKGOGN+ICOUNT)=10**10+IDES3*10**8+IDES                      QAM  350
       CGOGN3(NKGOGN+ICOUNT)=CGOGN3(K)                                   QAM  355
  240 CONTINUE                                                           QAM  360
       NKGOGN=NKGOGN+ICOUNT                                              QAM  365
       DO 200 L=1,4                                                      QAM  370
       DO 202 J=1,NROUTE                                                 QAM  375
       DAY=FLOAT(IROUTE(J)/1000000)*.01                                  QAM  380
  204 ITN=MOD(IROUTE(J)/10000,100)                                       QAM  385
       ITYPE=MOD(IROUTE(J)/1000,10)                                      QAM  390
       TOTL=CAPACW(ITYPE)*DAY                                            QAM  395
       IF(L.EQ.1) TOTL=TOTL*.50                                          QAM  400
       NIT=NPITIN(ITN)                                                   QAM  405
       IF(L.NE.1) GO TO 325                                              QAM  410
        JTN=NIT-1                                                        QAM  415
       DO 205 K=1,JTN                                                    QAM  420
      ISEG(J,K,1)=CAPACW(ITYPE)*DAY  *CAPCV(J)    +.5                    QAM  425
       SEGA(J,K)=SEGA(J,K)+CAPACV(ITYPE)*DAY      +.5                    QAM  430
  205 ISEG(J,K,2)=CAPACV(ITYPE)*DAY *CAPCV(J)                            QAM  435
  325 DO 206 K=1,NKGOGN                                                  QAM  440
       IF(CGOGN3(K).LE.0.0) GO TO 206                                    QAM  445
       NORIG=0                                                           QAM  450
       NDEL=0                                                            QAM  455
       NTRANS=0                                                          QAM  460
       NTRAN=0                                                           QAM  465
      IORIG=MOD(KGOGN1(K)/100,100)                                       QAM  470
       IORIGT=MOD(KGOGN1(K)/100000000,100)                               QAM  475
        IDEST=MOD(KGOGN1(K),100 )                                        QAM  480
      IDESTT=MOD(KGOGN1(K)/10000,100)                                    QAM  485
       GO TO  (501,502,503, 555),L                                       QAM  490
  501 IF(IORIGT.NE.0) GO TO 206                                          QAM  495
      IF(IDESTT.NE.0) GO TO 206                                          QAM  500
       GO TO 555                                                         QAM  505
  502  IF(IORIGT.EQ.0.AND.IDESTT.NE.0) GO TO 555                         QAM  510
       GO TO 206                                                         QAM  515
  503 IF(IORIGT.NE.0.AND.IDESTT.NE.0) GO TO 555                          QAM  520
       GO TO 206                                                         QAM  525
  555  ICHECK=KGOGN1(K)/10000000000                                      QAM  530
       ISTART=0                                                          QAM  535
       IEND=0                                                            QAM  540
       DO 207 KK=1,NIT                                                   QAM  545
```

```
      NTRM=NPITN1(ITN,KK)                                                QAM  550
       IF(ISTART.NE.0) GO TO 210                                         QAM  555
       IF(IORIG.EQ.NTRM) GO TO 209                                       QAM  560
       IF(IORIGT.EQ.NTRM) GO TO 219                                      QAM  565
       GO TO 207                                                         QAM  570
  209  ISTART=KK                                                         QAM  575
       NORIG=NTRM                                                        QAM  580
      GO TO 207                                                          QAM  585
  219  ISTART=-KK                                                        QAM  590
       NORIG=NTRM                                                        QAM  595
       IF(ICHECK.LE.0) NTRAN=NTRM                                        QAM  600
       GO TO 207                                                         QAM  605
  210  IF(IDEST.EQ.NTRM) GO TO 211                                       QAM  610
       IF(IDESTT.EQ.NTRM) GO TO 221                                      QAM  615
       GO TO 207                                                         QAM  620
  211  IEND=KK                                                           QAM  625
       NDEL=NTRM                                                         QAM  630
       GO TO 226                                                         QAM  635
  221  IEND=-KK                                                          QAM  640
       IF(ICHECK.LE.0) NTRANS=NTRM                                       QAM  645
       GO TO 226                                                         QAM  650
  207  CONTINUE                                                          QAM  655
       GO TO 206                                                         QAM  660
  226  LIM1=IABS(ISTART)  +1                                             QAM  665
      LIM2=IABS(IEND)-1                                                  QAM  670
      DO 505 KK=LIM1,LIM2                                                QAM  675
      IF(NORIG.NE.NPITN1(ITN,KK)) GO TO 505                              QAM  680
      IF(ISTART.GT.0) ISTART=KK                                          QAM  685
      IF(ISTART.LT.0) ISTART=-KK                                         QAM  690
      GO TO 227                                                          QAM  695
  505 CONTINUE                                                           QAM  700
  227 II=IABS(ISTART) +1                                                 QAM  705
       JJ=IABS(IEND)-1                                                   QAM  710
      WT=ISEG(J,II-1,1)                                                  QAM  715
      CUBES=ISEG(J,II-1,2)                                               QAM  720
       IF(JJ.LT.II) GO TO 436                                            QAM  725
       DO 230 KK=II,JJ                                                   QAM  730
      IF(WT.GT.ISEG(J,KK,1)) WT=ISEG(J,KK,1)                             QAM  735
      IF(CUBES.GT.ISEG(J,KK,2)) CUBES=ISEG(J,KK,2)                       QAM  740
  230 CONTINUE                                                           QAM  745
  436 IF(L.EQ.1.AND.WT.GT.TOTL) WT=TOTL                                  QAM  750
       IF(WT/CCONVF.LT.CUBES) CUBES=WT/CCONVF                            QAM  755
       II=II-1                                                           QAM  760
       IF(CUBES.LT.CGOGN3(K)) GO TO 228                                  QAM  765
       CUBES=CGOGN3(K)                                                   QAM  770
       CGOGN3(K)=0.                                                      QAM  775
       GO TO 229                                                         QAM  780
  228  CGOGN3(K)=CGOGN3(K)-CUBES                                         QAM  785
  229  ICUBES=CUBES+.5                                                   QAM  790
       JSEG(J,II,1)=JSEG(J,II,1)+ICUBES                                  QAM  795
       IF(IEND.GT.0) JSEG(J,JJ,2)=JSEG(J,JJ,2)+ICUBES                    QAM  800
       IF(IEND.LT.0) JSEG(J,JJ,3)=JSEG(J,JJ,3)+ICUBES                    QAM  805
      DO 231 KK=II,JJ                                                    QAM  810
      ISEG(J,KK,1)=ISEG(J,KK,1)-CUBES*CCONVF                             QAM  815
      ISEG(J,KK,2)=ISEG(J,KK,2)-CUBES                                    QAM  820
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231  SEGU(J,KK)=SEGU(J,KK)+CUBES                                          QAM  825
     LM1=IABS(ISTART)                                                     QAM  830
     LM2=IABS(IEND)-1                                                     QAM  835
     DO 20 LK=LM1,LM2                                                     QAM  840
     LM3=LM1+1                                                            QAM  845
     LM4=LM2+1                                                            QAM  850
     IORG=NPITN1(ITN,LK)                                                  QAM  855
     DO 25 MM=LM3,LM4                                                     QAM  860
     IDES=NPITN1(ITN,MM)                                                  QAM  865
  25 WRITE(7,7000) IORG,IDES,CUBES                                        QAM  870
7000 FORMAT(2I5,F10.2)                                                    QAM  875
  20 CONTINUE                                                             QAM  880
     IF(ISTART.GT.0)                                                      QAM  885
    1 SHIP(NORIG)=SHIP(NORIG)+CUBES                                       QAM  890
      IF(NDEL.NE.0) DEL(NDEL)=DEL(NDEL)+CUBES                             QAM  895
      IF(NTRANS.NE.0) TRANS(NTRANS)=TRANS(NTRANS)+CUBES                   QAM  900
      IF(NTRAN.NE.0) TRANS(NTRAN)=TRANS(NTRAN)+CUBES                      QAM  905
      IF(NTRAN.NE.0) CTRANS= CTRANS+CUBES                                 QAM  910
      IF(NTRANS.NE.0) CTRANS=CTRANS    +CUBES                             QAM  915
      IF(NDEL.NE.0) CDEL=CDEL+CUBES                                       QAM  920
      CSHIP=CSHIP+CUBES                                                   QAM  925
 206 CONTINUE                                                             QAM  930
 202 CONTINUE                                                             QAM  935
 200 CONTINUE                                                             QAM  940
     ENDFILE 7                                                            QAM  945
      WRITE(6,4000)        IDRUN                                          QAM  950
4000 FORMAT(1H1,4X,12A6                                                   QAM  955
    1           ,25(/),50X,*QUICKTRANS AIR-LIFT MODEL*//60X,*(QUAM)*)     QAM  960
      WRITE(6,2006)                                                       QAM  965
      DO 400 I=1,NTERM                                                    QAM  970
      STAN(I)=0                                                           QAM  975
      DO 415 JJ=1,NKGOGN                                                  QAM  980
      IF(CGOGN3(JJ).LE.0.0) GO TO 415                                     QAM  985
      IF(MOD(KGOGN1(JJ)/100     ,100).NE.I) GO TO 416                     QAM  990
      STAN(I)=STAN(I)+CGOGN3(JJ)                                          QAM  995
      GO TO 415                                                           QAM 1000
 416 IF(MOD(KGOGN1(JJ)/100000000,100).EQ.I) US(I)=US(I)+CGOGN3(JJ)        QAM 1005
 415 CONTINUE                                                             QAM 1010
      TEMP(6)=US(I)*CCONVF                                                QAM 1015
      TEMP(5)=STAN(I)       *CCONVF                                       QAM 1020
      TEMP(3)=GEN(I)*CCONVF                                               QAM 1025
      TEMP(2)=SHIP(I)*CCONVF                                              QAM 1030
      TEMP(1)=DEL(I)*CCONVF                                               QAM 1035
      TEMP(4)=TRANS(I)*CCONVF                                             QAM 1040
      DO 500 LL=1,6                                                       QAM 1045
 500 TOT(LL)=TOT(LL)+TEMP(LL)                                             QAM 1050
 400 WRITE(6,2007) ITNAM(I),(TEMP(J),J=1,6)                               QAM 1055
      WRITE(6,3000) (TOT(LL),LL=1,6)                                      QAM 1060
      DO 300 I=1,NROUTE                                                   QAM 1065
      RMI(I)=0                                                            QAM 1070
      TMAV(I)=0                                                           QAM 1075
      TMUS(I)=0                                                           QAM 1080
         J=MOD(IROUTE(I),1000)                                            QAM 1085
      K=MOD(IROUTE(I)/1000,10)                                            QAM 1090
      WRITE(6,2000) J      ,VNAM(K)                                       QAM 1095
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      ITN=     MOD(IROUTE(I)/10000,100)                                    QAM 1100
      NT=NPITIN(ITN)     -1                                                QAM 1105
     DO 302 JJ=1,8                                                        QAM 1110
 302 TOT(JJ)=0.0                                                          QAM 1115
      DO 301 J=1,NT                                                       QAM 1120
     IORIG=NPITN1(ITN,J)                                                  QAM 1125
     IDES=NPITN1(ITN,J+1)                                                 QAM 1130
 306 TEMP(1)=FLOAT(IROUTE(I)/1000000)*.01                                 QAM 1135
      K=FLOAT(IDES)/3.+.9                                                 QAM 1140
      ITYPE=MOD(IROUTE(I)/1000,10)                                        QAM 1145
       M=MOD(IDES,3)                                                      QAM 1150
       IF(M.LE.0) M=3                                                     QAM 1155
      TEMP(2)=MOD(IDIST(IORIG,K)/10000**(M-1),10000)                      QAM 1160
      TEMP(3)=CAPACW(ITYPE)   * TEMP(1)                                   QAM 1165
      RMI(I)=RMI(I)+TEMP(2)*TEMP(1)                                       QAM 1170
      TEMP(4)=TEMP(2)*TEMP(3)/2000.                                       QAM 1175
      TEMP(5)=SEGU(I,J)*CCONVF                                            QAM 1180
      TMAV(I)=TMAV(I)+TEMP(4)                                             QAM 1185
      TEMP(6)=TEMP(5)*TEMP(2)/2000.                                       QAM 1190
       TMUS(I)=TMUS(I)+TEMP(6)                                            QAM 1195
      IF(TEMP(2).GT.0.0) TEMP(7)=TEMP(6)/TEMP(4)*100.                     QAM 1200
      TEMP(8)=0.                                                          QAM 1205
      IF(TEMP(4)*.8.LE.TEMP(6)) TEMP(8)=TEMP(6)-(.8*TEMP(4))              QAM 1210
      IF(TEMP(2).LE.0.0) GO TO 301                                        QAM 1215
      TEMP(9)=TEMP(8)*2000.  /TEMP(2)                                     QAM 1220
     DO 303 JJ=1,8                                                        QAM 1225
     IF(JJ.EQ.6) GO TO 303                                                QAM 1230
     TOT(JJ)=TOT(JJ)+TEMP(JJ+1)                                           QAM 1235
 303 CONTINUE                                                             QAM 1240
 301 WRITE(6,2001) ITNAM(IORIG),ITNAM(IDES),(TEMP(L),L=1,9)               QAM 1245
     IF(TMAV(I).GT.0) TOT(6)=TMUS(I)/TMAV(I)*100.                         QAM 1250
     WRITE(6,2011) (TOT(J),J=1,8)                                         QAM 1255
2011 FORMAT(//5X,*TOTAL*,16X,F6.0,1X,2(2X,F12.0),2F12.0,4X,F8.3,          QAM 1260
    1 F14.0,2X,F14.0)                                                     QAM 1265
      WRITE(6,2002)                                                       QAM 1270
      ON=0                                                                QAM 1275
      OFF=0                                                               QAM 1280
     DO 318 LL=1,6                                                        QAM 1285
 318 TOT(LL)=0                                                            QAM 1290
     NT=NT+1                                                              QAM 1295
       DO 309 J=1,NT                                                      QAM 1300
     IORIG=NPITN1(ITN,J)                                                  QAM 1305
     TEMP(2)=FLOAT(JSEG(I,J,1)) *CCONVF                                   QAM 1310
     IF(J.EQ.1) SAVE=TEMP(2)                                              QAM 1315
     TEMP(3)=SAVE                                                         QAM 1320
     TEMP(1)=0                                                            QAM 1325
     IF(J.EQ.1) GO TO 315                                                 QAM 1330
     TEMP(1)=FLOAT(JSEG(I,J-1,2)+JSEG(I,J-1,3))*CCONVF                    QAM 1335
 315  OFF=OFF+TEMP(1)                                                     QAM 1340
      ON=ON+TEMP(2)                                                       QAM 1345
     TEMP(5)=0                                                            QAM 1350
     TEMP(6)=0                                                            QAM 1355
     SAVE    =ON-OFF-FLOAT(JSEG(I,J,2)+JSEG(I,J,3))*CCONVF                QAM 1360
 321 TEMP(4)=ON-OFF                                                       QAM 1365
     IF(J.EQ.1) GO TO 320                                                 QAM 1370
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      TEMP(5)=FLOAT(JSEG(I,J-1,2))*CCONVF                                    QAM 1375
      TEMP(6)=FLOAT(JSEG(I,J-1,3))*CCONVF                                    QAM 1380
  320 DO 319 LL=1,6                                                          QAM 1385
  319 TOT(LL)=TOT(LL)+TEMP(LL)                                               QAM 1390
  309 WRITE(6,2003) ITNAM(IORIG),              (TEMP(L),L=1,6)               QAM 1395
        WRITE(6,2009) (TOT(LL),LL=1,6)                                       QAM 1400
  300 CONTINUE                                                               QAM 1405
       TMD=0                                                                 QAM 1410
      DO 326 K=1,2                                                           QAM 1415
       DO 327 LL=1,10                                                        QAM 1420
  327 TOT(LL)=0.0                                                            QAM 1425
      WRITE(6,2010) VEH(K)                                                   QAM 1430
 2010 FORMAT(1H1,4X,A6,* REPORT*//)                                          QAM 1435
       WRITE(6,2004)                                                         QAM 1440
      DO 316 I=1,NROUTE                                                      QAM 1445
       ITYPE=MOD(IROUTE(I)/1000,10)                                          QAM 1450
      CR(ITYPE)=CSTR(ITYPE)                                                  QAM 1455
      IF(K.EQ.1.AND.VNAM(ITYPE).EQ.VEH(2)) GO TO 316                         QAM 1460
      IF(K.EQ.2.AND.VNAM(ITYPE).NE.VEH(2)) GO TO 316                         QAM 1465
       NAME=MOD(IROUTE(I),1000)                                              QAM 1470
       FEE=0.                                                                QAM 1475
       TC=0                                                                  QAM 1480
       DAY= FLOAT(IROUTE(I)/1000000)*.01                                     QAM 1485
       ITN=MOD(IROUTE(I)/10000,100)                                          QAM 1490
       LAND=(NPITIN(ITN)-1)* DAY                                             QAM 1495
       FL=TMUS(I)/      TMAV(I)    *100.                                     QAM 1500
       TMC=0.                                                                QAM 1505
       TM=0.0                                                                QAM 1510
      IF(VEH(2).EQ.VNAM(ITYPE)) GO TO 317                                    QAM 1515
       TM=RMI(I)*CSTR(ITYPE)                                                 QAM 1520
       FEE=CLAND*FLOAT(LAND)                                                 QAM 1525
      GO TO 1317                                                             QAM 1530
  317 TM=CSTR(ITYPE)*DAY                                                     QAM 1535
      CR(ITYPE)=TM/RMI(I)                                                    QAM 1540
 1317  TC=FEE+TM                                                            QAM 1545
       CSTSYS=CSTSYS+TC                                                      QAM 1550
       TMD=TMD+TMUS(I)                                                       QAM 1555
       IF(TMUS(I).GT.0.0) TMC=TC/TMUS(I)                                     QAM 1560
       IF(TMAV(I).GT.0) TMAC=TC/TMAV(I)                                      QAM 1565
       TOT(1)=TOT(1)+LAND                                                    QAM 1570
       TOT(2)=TOT(2)+RMI(I)                                                  QAM 1575
       TOT(3)=TOT(3)+TMAV(I)                                                 QAM 1580
       TOT(4)=TOT(4)+TMUS(I)                                                 QAM 1585
       TOT(6)=TOT(6)+TM                                                      QAM 1590
       TOT(7)=TOT(7)+FEE                                                     QAM 1595
       TOT(8)=TOT(8)+TC                                                      QAM 1600
      VSUMC(ITYPE)=VSUMC(ITYPE)+TC                                           QAM 1605
      VEHS(ITYPE,1)=VEHS(ITYPE,1)+LAND                                       QAM 1610
      VEHS(ITYPE,2)=VEHS(ITYPE,2)+RMI(I)                                     QAM 1615
      VEHS(ITYPE,3)=VEHS(ITYPE,3)+TMAV(I)                                    QAM 1620
      VEHS(ITYPE,4)=VEHS(ITYPE,4)+   TMUS(I)                                 QAM 1625
      VEHS(ITYPE,6)=VEHS(ITYPE,6)+TM                                         QAM 1630
      VEHS(ITYPE,7)=VEHS(ITYPE,7)+FEE                                        QAM 1635
      VEHS(ITYPE,8)=VEHS(ITYPE,8)+TC                                         QAM 1640
      WRITE(6,2005) NAME,LAND,ITYPE,RMI(I),TMAV(I),TMUS(I),FL,               QAM 1645
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     1   CR(ITYPE),TM,FEE,TC,TMAC,TMC                                    QAM 1650
  316 CONTINUE                                                           QAM 1655
      IF(TOT(3).GT.0) TOT(9)=TOT(8)/TOT(3)                               QAM 1660
      IF(TOT(4).GT.0) TOT(10)=TOT(8)/TOT(4)                              QAM 1665
       IF(TOT(3).GT.0) TOT(5)=TOT(4)/TOT(3)*100.                         QAM 1670
       WRITE(6,2012) (TOT(J),J=1,10)                                     QAM 1675
 2012 FORMAT(//5X,*TOTAL*,1X,F6.0,4X,3F11.0,2X,F6.2,7X,F12.2,F10.0,      QAM 1680
     1 10X,F10.0,1X,2F10.3)                                             QAM 1685
      IF(K.NE.1) GO TO 326                                              QAM 1690
      COSTA=ADJT*TOT(8)                                                 QAM 1695
      TOT(8)=TOT(8)+COSTA                                               QAM 1700
      CSTSYS=CSTSYS+COSTA     +TCOST                                    QAM 1705
      WRITE(6,999) ADJT,COSTA,TOT(8)                                    QAM 1710
  999 FORMAT(///5X,*AIRCRAFT COST ADJUSTMENT FACTOR =*,F10.3,           QAM 1715
     1 *,COST INCREASE =*,F15.3,*, TOTAL AIRCRAFT COST =*,F15.3)        QAM 1720
  326 CONTINUE                                                          QAM 1725
      DO 888 KK=1,10                                                    QAM 1730
  888 TOT(KK)=0                                                         QAM 1735
      WRITE(6,2013)                                                     QAM 1740
      DO 329 JJ=1,NVAT                                                  QAM 1745
      IF(VEHS(JJ,3).GT.0) TEMP(1)=VSUMC(JJ)/VEHS(JJ,3)                  QAM 1750
       IF(VEHS(JJ,4).GT.0) TEMP(2)=VSUMC(JJ)/VEHS(JJ,4)                 QAM 1755
      IF(VEHS(JJ,3).GT.0) VEHS(JJ,5)=VEHS(JJ,4)/VEHS(JJ,3)*100.         QAM 1760
      DO 655 KK=1,8                                                     QAM 1765
  655 TOT(KK)=  TOT(KK)+VEHS(JJ,KK)                                     QAM 1770
  329 WRITE(6,2014) VNAM(JJ),(VEHS(JJ,KK),KK=1,5),  CR(JJ)              QAM 1775
     1,(VEHS(JJ,KK),KK=6,8),TEMP(1),TEMP(2)                            QAM 1780
       WRITE(6,5555) TCOST,COSTA                                        QAM 1785
 5555 FORMAT(92X,1H*,F8.0,1H*,F11.0,* (TAX ADJ)*)                       QAM 1790
      TOT(5)=TOT(4)/TOT(3)*100.                                         QAM 1795
      TEMP(1)=TOT(6)/TOT(2)                                             QAM 1800
      TOT(8)=TOT(8)+COSTA    +TCOST                                     QAM 1805
      TOT(9)=TOT(8)/TOT(3)                                              QAM 1810
      TOT(10)=TOT(8)/TOT(4)                                             QAM 1815
      WRITE(6,4444) (TOT(KK),KK=1,5),TEMP(1),(TOT(KK),KK=6,7)           QAM 1820
     1,TCOST,(TOT(KK),KK=8,10)                                          QAM 1825
 4444 FORMAT(//4X,*TOTAL*,F9.0,F11.0,1X,2F12.0,2X,F6.2,1X,F7.4,F13.2,   QAM 1830
     1 F10.0,F8.0,F12.0,1X,2F10.3)                                      QAM 1835
 2013 FORMAT(1H1,4X,*MANAGEMENT SUMMARY*/5X,18(1H-)//57X,*LOAD*,        QAM 1840
     13X,*RATE*,6X,*TOTAL*/5X,*V/A*,14X,*MILES*,3X,2(3X,*TON/MILES*),2X,QAM 1845
     2*FACTOR*,2X,*PER*,6X,*MILEAGE*,4X,*LANDING *,2X,*TERMINAL*,3X,    QAM 1850
     4*TOTAL*,2(3X,*TON/MILES*)/                                        QAM 1855
     45X,*TYPE*,4X,*STOPS*,3X,                                          QAM 1860
     5*TRAVELED*,4X,*AVAILABLE*,5X,*MOVED*,4X,*ACHVED*,2X,*MILE*,6X,    QAM 1865
     6*COST*,8X, *FEES*,2(5X,*COSTS*),3X,*(AV) COST*,3X,*(MV) COST*)    QAM 1870
 2014 FORMAT(4X,A6,F8.0, F11.0,1X,2F12.0,2X,                            QAM 1875
     1F6.2,1X,F7.4,F13.2,F10.0,8X,F12.0,1X,2F10.3)                      QAM 1880
       TEMP(1)=CGEN*CCONVF                                              QAM 1885
       TEMP(2)=CSHIP*CCONVF                                             QAM 1890
       TEMP(3)=CDEL*CCONVF                                              QAM 1895
       TEMP(4)=CTRANS*CCONVF                                            QAM 1900
       TEMP(5)=CSTSYS                                                   QAM 1905
       TEMP(6)=CSTSYS/TMD                                               QAM 1910
       TEMP(7)=CSTSYS/(TEMP( 3)/2000.)                                  QAM 1915
        WRITE(6,2008) (TEMP(J),J=1,7)                                   QAM 1920
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2008 FORMAT(///5X,*TOTAL POUNDS GENERATED = * ,F20.2/5X,                    QAM 1925
    1 *TOTAL POUNDS SHIPPED = * ,F20.2/5X,*TOTAL POUNDS DELIVERED = *,     QAM 1930
    2F12.2/5X,*TOTAL POUNDS TRANSLOADED = *F20.2/5X,                       QAM 1935
    3*TOTAL SYSTEM COST (IN DOLLARS) = *,F20.4/5X,*TOTAL COST PER TON/MQAM 1940
    4ILE = *,F12.4/5X,*TOTAL COST PER TON = *,F12.4)                       QAM 1945
2002 FORMAT(////8X,*TERMINAL*,6X,                                          QAM 1950
    1*OFF LOAD*,4X,*ON LOAD*,4X,* THRU *,4X,*DEPART*,                      QAM 1955
    2 4X,*DELVY UNLOAD*,4X,*TRANSLOAD*/                                    QAM 1960
    223X,                  *POUNDS*,6X,*POUNDS*,4X,*POUNDS*,               QAM 1965
    3 4X,*POUNDS*7X,*POUNDS*,8X,*POUNDS*)                                 QAM 1970
2009 FORMAT(/// 5X,*TOTAL*,7X,                                             QAM 1975
    1                  F12.0,F11.0,F10.0,4X,F12.0,F13.0,F13.0 )            QAM 1980
2003 FORMAT(8X,A4,6X,   F12.0,F11.0,F10.0,2X,F12.0,F13.0,F13.0)            QAM 1985
2000 FORMAT(1H1,4X,*SEGMENT OPERATIONS SUMMARY*/5X,26(1H-)                 QAM 1990
    1///57X,I6,5X,A6 //8X,*SEGMENT*,4X,*TRIPS*,3X,*MILES*,2(3X,*TOTAL AQAM 1995
    2VAIL*),3X,*TOTAL LIFT*,5X,*TOTAL*,8X,*LOAD*                           QAM 2000
    1,5X,*TON/MILES*,8X,*POUNDS*/5X,*FROM*,6X,                             QAM 2005
    3   *TO*,18X,*CABIN LOAD*,5X,*TON/MILES*,5X,*UTILIZED*4X,*TON/MILESQAM 2010
    5*,5X,*FACTOR*,4X,*OVERFLOWN*,6X,*OVERFLOWN*/                          QAM 2015
    5              37X,*POUNDS*,22X,*POUNDS*,7X,*MOVED*,6X,*ACHIEVED*      QAM 2020
    6,1X,*UPON DEPARTURE*,2X,*UPON DEPARTURE* )                            QAM 2025
2001 FORMAT(5X,A4,4X,A4,F7.2   ,3X,F5.0,1X,2(3X,F11.0),2F12.0,             QAM 2030
    1              4X,F8.3,F14.0,2X,F14.0)                                 QAM 2035
2004 FORMAT(    5X,*MANAGEMENT SUMMARY*/5X,18(1H-)//57X,*LOAD*,            QAM 2040
    13X,*RATE*,4X,*TOTAL*/19X,*V/A*,4X,*MILES*,4X,2(*TON/MILES*,1X),1X,QAM 2045
    2*FACTOR*,2X,*PER*,4X,*MILEAGE*,4X,*LANDING *,2X,*TERMINAL*,3X,        QAM 2050
    4*TOTAL*,2(3X,*TON/MILES*)/                                            QAM 2055
    4                          5X,*ROUTE*,2X,*STOPS*,2X,*TYPE*,2X,         QAM 2060
    5*TRAVELED*,2X,*AVAILABLE*,3X,*MOVED*,4X,*ACHVED*,2X,*MILE*,4X,        QAM 2065
    6*COST*,8X, *FEES*,2(5X,*COSTS*),3X,*(AV) COST*,3X,*(MV) COST*)        QAM 2070
2005 FORMAT(4X,I6,2X,I4,2X,I4,1X,      F9.0,1X,F10.0,1X,F9.0,2X,           QAM 2075
    1F6.2,1X,F7.4,1X,F10.2,1X,F9.0,12X,F8.0,1X,2F10.3)                     QAM 2080
2006 FORMAT(1H1,*SYSTEM CARGO SUMMARY*/1X,21(1H-)///5X,*TERMINAL*,5X,      QAM 2085
    1*CARGO*,2(8X,*CARGO*),9X,*CARGO*,10X,*CARGO* ,10X,*CARGO*             QAM 2090
    2                          /7X,*CODE*,5X,*DEL (LBS)*,3X,               QAM 2095
    2*SHIPD (LBS)*,3X,                                                     QAM 2100
    2*GEN (LBS)*,3X,*TRNSLD (LBS)*,3X,*UNMOVED (LBS)*,3X,*UNSHIPD (LBS)QAM 2105
    3*                        /5X,8H--------,3X,9H---------,               QAM 2110
    43X,11H----------,3X,9H---------,3X,12H---------- ,                    QAM 2115
    5 2(3X,13H-------------  ))                                            QAM 2120
3000 FORMAT(6X,*TOTAL*                                                     QAM 2125
    1            ,2F14.0,F12.0,3F15.0)                                     QAM 2130
2007 FORMAT(7X,A4,2F14.0,F12.0,3F15.0)                                     QAM 2135
     WRITE(6,666)                                                          QAM 2140
 666 FORMAT(1H1)                                                           QAM 2145
     WRITE(6,777) (KGOGN1(I),CGOGN3(I),I=1,NKGOGN)                         QAM 2150
 777 FORMAT(4(I15,F10.0))                                                  QAM 2155
      STOP                                                                 QAM 2160
      END                                                                  QAM 2165
```

```
      SUBROUTINE LINKS(NP,NLINK ,NPT,NPT1,LINK,ITNAM)                    LNK    5
      DIMENSION NPT(40),NPT1(40,20),LINK(3000),ISAVE(5),ITNAM(99)        LNK   10
      WRITE(6,4000)                                                      LNK   15
 4000 FORMAT( 1H1,4X,*ERROR TRACE - INCOMPLETE ROUTING*///               LNK   20
     15X,*COMPLETED SEGMENTS*,5X,*ORIGIN  SEGMENTS ROUTED*)              LNK   25
      DO 10 I=1,NLINK                                                    LNK   30
      ISAVE(1)=MOD(LINK(I)/100,100)                                      LNK   35
      ISAVE(2)=MOD(LINK(I)/10000,100)                                    LNK   40
      ISAVE(3)=MOD(LINK(I)/1000000,100)                                  LNK   45
      ISAVE(4)=MOD(LINK(I)/10**8,100)                                    LNK   50
      ISAVE(5)=MOD(LINK(I),100)                                          LNK   55
      ICNT=0                                                             LNK   60
      NSAVE=4                                                            LNK   65
       IF(ISAVE(2).GT.0) GO TO 16                                        LNK   70
      ISAVE(2)=ISAVE(5)                                                  LNK   75
      NSAVE=1                                                            LNK   80
      GO TO 15                                                           LNK   85
   16 IF(ISAVE(3).GT.0) GO TO 17                                         LNK   90
      NSAVE=2                                                            LNK   95
      ISAVE(3)=ISAVE(5)                                                  LNK  100
      GO TO 15                                                           LNK  105
   17 IF(ISAVE(4).GT.0) GO TO 15                                         LNK  110
       NSAVE=3                                                           LNK  115
      ISAVE(4)=ISAVE(5)                                                  LNK  120
   15 DO 20 J=1,NSAVE                                                    LNK  125
       DO 30 K=1,NP                                                     LNK  130
      NNP=NPT(K)                                                         LNK  135
      ICK=0                                                              LNK  140
      DO 35 L=1,NNP                                                      LNK  145
      IF(ICK.EQ.0) GO TO 36                                              LNK  150
      IF(ISAVE(J+1).NE.NPT1(K,L)) GO TO 35                               LNK  155
      ICNT=ICNT+1                                                        LNK  160
      GO TO 20                                                           LNK  165
   36 IF(ISAVE(J).NE.NPT1(K,L)) GO TO 35                                 LNK  170
      ICK=1                                                              LNK  175
   35 CONTINUE                                                           LNK  180
   30 CONTINUE                                                           LNK  185
   20 CONTINUE                                                           LNK  190
      IF(NSAVE.EQ.ICNT) GO TO 10                                         LNK  195
      NSAVE=NSAVE+1                                                      LNK  200
      DO 40 J=1,NSAVE                                                    LNK  205
      KK=ISAVE(J)                                                        LNK  210
   40 ISAVE(J)=ITNAM(KK)                                                 LNK  215
      WRITE(6,2000) ICNT,(ISAVE(K),K=1,NSAVE)                            LNK  220
 2000 FORMAT(13X,I5,7X,5A4)                                              LNK  225
   10 CONTINUE                                                           LNK  230
       RETURN                                                           LNK  235
      END                                                                LNK  240
```

```
      SUBROUTINE TABLE(NTERM,ITNAM,NCGN,KG,CG,IDENT)                    TAB    5
       DIMENSION LINE(100,3),ITNAM(99),KG(7000),CG(7000),IDENT(12)      TAB   10
     1,XLINE(100),SMSH(99),SMDL(99)                                     TAB   15
      DO 666 I=1,NTERM                                                  TAB   20
      SMSH(I)=0                                                         TAB   25
  666 SMDL(I)=0                                                         TAB   30
      SMD=0                                                             TAB   35
      SMG=0                                                             TAB   40
      WRITE(6,2000) (IDENT(I),I=1,12)                                   TAB   45
 2000 FORMAT(1H1,59X,12A6///)                                           TAB   50
      ICHECK=0                                                          TAB   55
      LIM1=1                                                            TAB   60
      LIM2=6                                                            TAB   65
  400 IF(NTERM.LT.LIM2) LIM2=NTERM                                      TAB   70
      IF(ICHECK.EQ.0) GO TO 10                                          TAB   75
       WRITE(6,2001)(ITNAM(I),I=LIM1,LIM2)                              TAB   80
 2001 FORMAT(1H1,1X,////5X,6(*+*,7X,A4,7X))                             TAB   85
      WRITE(6,2003)                                                     TAB   90
      GO TO 15                                                          TAB   95
   10 WRITE(6,4002) (ITNAM(I),I=LIM1,LIM2)                              TAB  100
 4002 FORMAT(5X,6(*+*,7X,A4,7X))                                        TAB  105
      WRITE(6,2003)                                                     TAB  110
   15 DO 100 I=1,NTERM                                                  TAB  115
      DO 150 KK=1,NTERM                                                 TAB  120
      XLINE(KK)=0                                                       TAB  125
      DO 150 JJ=1,3                                                     TAB  130
  150  LINE(KK,JJ)=0                                                    TAB  135
      DO 200 J=LIM1,LIM2                                                TAB  140
      IF(I.EQ.J) GO TO 200                                              TAB  145
      JCHECK=J+I*100                                                    TAB  150
      DO 300 K=1,NCGN                                                   TAB  155
      IF(CG(K).LE.0.0) GO TO 300                                        TAB  160
      IF(JCHECK.NE.MOD(KG(K),10000)) GO TO 300                          TAB  165
      XLINE(J)=XLINE(J)+CG(K)                                           TAB  170
      ID3=MOD(KG(K)/10**8,100)                                          TAB  175
      IF(ID3.GT.0) LINE(J,3)=ITNAM(ID3)                                 TAB  180
      ID1=MOD(KG(K)/10000,100)                                          TAB  185
      ID2=MOD(KG(K)/1000000,100)                                        TAB  190
      IF(ID1.GT.0) LINE(J,1)=ITNAM(ID1)                                 TAB  195
       IF(ID2.GT.0) LINE(J,2)=ITNAM(ID2)                                TAB  200
      SMSH(I)=SMSH(I)+CG(K)                                             TAB  205
      SMDL(J)=SMDL(J)+CG(K)                                             TAB  210
      SMG=SMG+CG(K)                                                     TAB  215
      SMD=SMD+CG(K)                                                     TAB  220
  300 CONTINUE                                                          TAB  225
  200 CONTINUE                                                          TAB  230
      IF(LIM2.EQ.NTERM) GO TO 410                                       TAB  235
      WRITE(6,2002)ITNAM(I),(XLINE(J),(LINE(J,K),K=1,3),J=LIM1,LIM2)    TAB  240
 2002 FORMAT(1X,A4,6(1H.,F6.1,3A4))                                     TAB  245
      WRITE(6,2003)                                                     TAB  250
 2003 FORMAT(5X,*+*        ,18(6H------),*----*)                       TAB  255
      GO TO 100                                                         TAB  260
  410 WRITE(6,2002)ITNAM(I),(XLINE(J),(LINE(J,K),K=1,3),J=LIM1,LIM2)    TAB  265
      WRITE(6,2003)                                                     TAB  270
```

```
 100 CONTINUE                                                          TAB  275
     IF(LIM2.NE.NTERM) GO TO 160                                       TAB  280
     WRITE(6,2004) (ITNAM(I),SMSH(I),SMOL(I),I=1,NTERM)                TAB  285
     WRITE(6,2005) SMG,SMO                                             TAB  290
2004 FORMAT(1H1,4X,*CARGO GEN/DEL SUMMARY*//5X,*TERMINAL   GENERATED*  TAB  295
    1*   DELIVERED*/(9X,A4,2F12.1)//)                                  TAB  300
2005 FORMAT(5X,*TOTAL*,3X,2F12.1)                                      TAB  305
     RETURN                                                            TAB  310
 160 LIM1=LIM2+1                                                       TAB  315
      LIM2=LIM1+5                                                      TAB  320
     ICHECK=1                                                          TAB  325
     GO TO 400                                                         TAB  330
     END                                                               TAB  335
```

APPENDIX B

SAMPLE COMPUTER RUNS

Proposed QUICKTRANS transport network of October 1975 is given as sample run. Figure 2 is a related network diagram of sample.

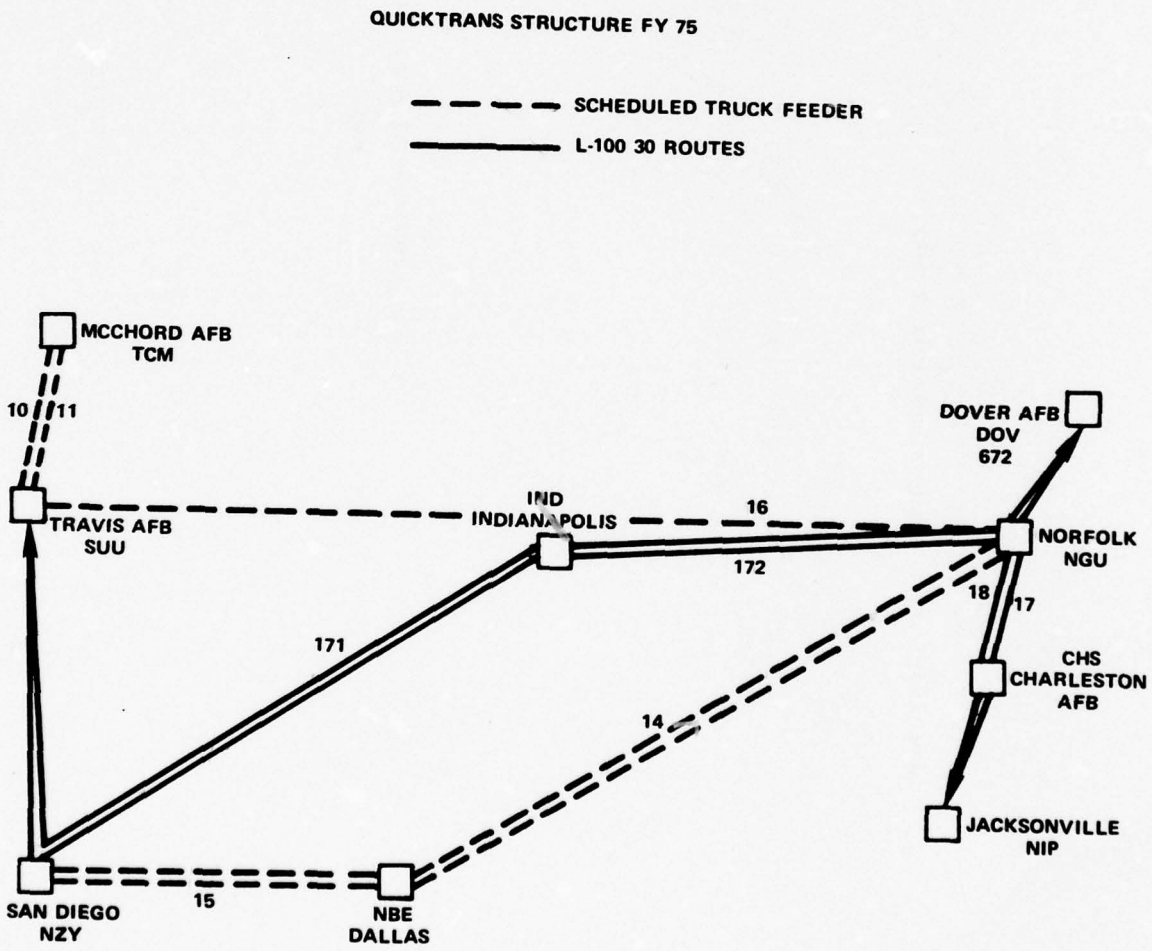

Figure 2 - QUICKTRANS Route Diagram

JACK CUNNINGHAM 30 OCT 1975 (TRUCKS/AIRCRAFT)

QUICKTRANS AIR-LIFT MODEL

(QUAM)

SYSTEM CARGO SUMMARY

TERMINAL CODE	CARGO DEL (LBS)	CARGO SHIPD (LBS)	CARGO GEN (LBS)	CARGO TRNSLD (LBS)	CARGO UNMOVED (LBS)	CARGO UNSHIPD (LBS)
DOV	1307406.	946372.	946372.	0.	0.	0.
NGU	2133680.	2264304.	2264304.	1607302.	0.	0.
IND	166078.	182040.	182040.	0.	0.	0.
CHS	680808.	650168.	650168.	0.	0.	0.
NIP	606198.	541280.	541280.	264250.	0.	363682.
COF	0.	0.	12000.	0.	12000.	0.
NQX	0.	0.	40500.	0.	40500.	0.
NPA	0.	0.	257040.	0.	257040.	0.
NBE	183512.	192000.	192000.	0.	0.	0.
NZY	1355384.	1457680.	1457680.	39940.	0.	0.
SUU	1643794.	2069040.	2069040.	820782.	0.	0.
TCM	855502.	683620.	683620.	0.	0.	0.
TOTAL	8932362.	8986504.	9296044.	2792274.	309540.	363682.

	DOV	NGU	IND	CHS	NIP	COF
DOV.	0.0	209.5	12.3	50.1 NGU	27.6 NGU	1.0 NGU NIP
NGU.	300.1	0.0	12.9	144.3	148.1	9.0 NIP
IND.	11.1 NGU	24.4	0.0	8.9	4.4	0.0
CHS.	88.5	97.0	6.1 NGU	0.0	6.1	4.9 NIP
NIP.	28.6	137.4	2.7 NGU	8.2	0.0	0.0
COF.	0.0	.8 NIP	0.0	.8 NIP	0.0	0.0
NQX.	1.5 NIP	11.3 NIP	.8 NIP NGU	.8 NIP	0.0	0.0
NPA.	17.6 NIP	47.9 NIP	1.3 NIP NGU	15.1 NIP	0.0	0.0
NBE.	12.0 NGU	18.0	1.0 NGU	1.0 NGU	16.0 NGU	0.0
NZY.	49.3 NGU	220.6	13.7	31.5	35.6	4.1 NIP
SUU.	121.0 NGU	244.2	24.4	66.6 NGU	59.9 NGU	13.3 NGU NIP
TCM.	23.9 SUU NGU	55.9 SUU	8.0 SUU NGU	13.3 SUU NGU	5.3 SUU NGU	2.7 SUU NGU NIP

	NQX	NPA	NBE	NZY	SUU	TCM
DOV.	1.0 NGU NIP	16.4 NGU NIP	2.0 NGU	63.4	62.3	27.6 SUU
NGU.	9.0 NIP	43.8 NIP	18.0	189.3	198.4	59.2 SUU
IND.	0.0	1.1 NIP	1.1 NGU	20.0	11.1	8.9 SUU
CHS.	0.0	3.6 NIP	0.0	17.0 NGU	61.9 NGU	48.0 NGU SUU
NIP.	0.0	0.0	19.0 NGU	29.9 NGU	34.0 NGU	18.9 NGU SUU
COF.	0.0	0.0	0.0	1.5 NIP NGU	3.0 NIP NGU	0.0
NQX.	0.0	0.0	0.0	5.3 NIP NGU	.8 NIP NGU	0.0
NPA.	0.0	0.0	12.6 NIP NGU	15.1 NIP NGU	15.1 NIP NGU	3.8 NIP NGU SUU
NBE.	0.0	18.0 NGU NIP	0.0	8.0	17.0 NZY	5.0 NZY SUU
NZY.	5.5 NIP	26.0 NIP	11.0	0.0	253.5	78.1 SUU
SUU.	1.1 NIP	20.0 NIP	26.6 NZY	263.1	0.0	194.3
TCM.	0.0	1.3 SUU NGU NIP	1.3 SUU NZY	65.2 SUU	164.9	0.0

CARGO GEN/DEL SUMMARY

TERMINAL	GENERATED	DELIVERED
OOV	473.2	653.7
NGU	1132.2	1066.8
IND	91.0	83.0
CHS	325.1	340.4
NIP	270.6	303.1
COF	6.0	35.0
NQX	20.3	16.6
NPA	128.5	130.2
NBE	96.0	91.8
NZY	728.8	677.7
SUU	1034.5	821.9
TCM	341.8	427.8
TOTAL	4648.0	4648.0

ERROR TRACE - INCOMPLETE ROUTING

COMPLETED SEGMENTS	ORIGIN SEGMENTS ROUTED
2	NBE NGU NIP NPA
2	NPA NIP NGU NBE
2	DOV NGU NIP COF
2	DOV NGU NIP NQX
2	DOV NGU NIP NPA
1	NGU NIP COF
1	NGU NIP NQX
1	NGU NIP NPA
1	IND NIP NPA
1	CHS NIP COF
1	CHS NIP NPA
1	COF NIP NGU
1	NQX NIP DOV
1	NQX NIP NGU
2	NQX NIP NGU IND
1	NQX NIP CHS
2	NQX NIP NGU NZY
2	NQX NIP NGU SUU
1	NPA NIP DOV
1	NPA NIP NGU
2	NPA NIP NGU IND
1	NPA NIP CHS
2	NPA NIP NGU NZY
2	NPA NIP NGU SUU
3	NPA NIP NGU SUU TCM
1	NZY NIP COF
1	NZY NIP NQX
1	NZY NIP NPA
1	COF NIP CHS
2	COF NIP NGU NZY
2	COF NIP NGU SUU
2	SUU NGU NIP COF
1	SUU NIP NQX
1	SUU NIP NPA
3	TCM SUU NGU NIP COF
3	TCM SUU NGU NIP NPA

SEGMENT OPERATIONS SUMMARY

10 TRUCK

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
SUU	TCM	38.70	650.	1161000.	377325.	855502.	278038.	73.687	0.	0.
TOTAL			650.	1161000.	377325.	855502.	278038.	73.687	0.	0.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
SUU	0.	855502.	855502.	855502.	0.	0.
TCM	855502.	0.	0.	0.	855502.	0.
TOTAL	855502.	855502.	855502.	855502.	855502.	0.

SEGMENT OPERATIONS SUMMARY

11 TRUCK

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
TCM	SUU	25.80	650.	774000.	251550.	683620.	222177.	88.323	20936.	64420.
TOTAL			650.	774000.	251550.	683620.	222177.	88.323	20936.	64420.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
TCM	0.	683620.	683620.	683620.	0.	0.
SUU	683620.	0.	0.	0.	329840.	353780.
TOTAL	683620.	683620.	683620.	683620.	329840.	353780.

SEGMENT OPERATIONS SUMMARY

14 TRUCK

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
NZY	NBE	12.90	1208.	387000.	233748.	332859.	201047.	86.010	14848.	23259.
NBE	NGU	12.90	1239.	387000.	239747.	386999.	239746.	100.000	47949.	77399.
TOTAL			2447.	774000.	473495.	719858.	440793.	93.094	61997.	100658.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
NZY	0.	332859.	332859.	332859.	0.	0.
NBE	77860.	132000.	254999.	386999.	77860.	0.
NGU	386999.	0.	0.	0.	229500.	157499.
TOTAL	464859.	464859.	587858.	719858.	307360.	157499.

SEGMENT OPERATIONS SUMMARY

15 TRUCK

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
NGU	NBE	25.80	1239.	774000.	479493.	621868.	385247.	80.345	1653.	2668.
NBE	NZY	25.80	1288.	774000.	467496.	576216.	348034.	74.447	0.	0.
TOTAL			2447.	1548000.	946989.	1198084.	733282.	77.433	1653.	2668.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
NGU	0.	621868.	621868.	621868.	0.	0.
NBE	105652.	60000.	516216.	576216.	105652.	0.
NZY	576216.	0.	0.	0.	532216.	44000.
TOTAL	681868.	681868.	1138084.	1198084.	637868.	44000.

SEGMENT OPERATIONS SUMMARY

16 TRUCK

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
SUU	NGU	25.80	2543.	774000.	984141.	773999.	984140.	100.000	196827.	154799.
TOTAL			2543.	774000.	984141.	773999.	984140.	100.000	196827.	154799.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
SUU	0.	773999.	773999.	773999.	0.	0.
NGU	773999.	0.	0.	0.	387000.	386999.
TOTAL	773999.	773999.	773999.	773999.	387000.	386999.

SEGMENT OPERATIONS SUMMARY

17 TRUCK

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
NGU	CHS	21.60	357.	648000.	115668.	550468.	98259.	84.949	5724.	32868.
TOTAL			357.	648000.	115668.	550468.	98259.	84.949	5724.	32868.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
NGU	0.	550468.	550468.	550468.	0.	0.
CHS	550468.	0.	0.	0.	550468.	0.
TOTAL	550468.	550468.	550468.	550468.	550468.	0.

SEGMENT OPERATIONS SUMMARY

18 TRUCK

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
CHS	NGU	21.60	357.	648000.	115668.	443958.	79247.	68.512	0.	0.
TOTAL			357.	648000.	115668.	443958.	79247.	68.512	0.	0.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
CHS	0.	443958.	443958.	443958.	0.	0.
NGU	443958.	0.	0.	0.	194080.	249878.
TOTAL	443958.	443958.	443958.	443958.	194080.	249878.

SEGMENT OPERATIONS SUMMARY

672 L-100

SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
NIP	CHS	30.40	207.	1322400.	136868.	850820.	88060.	64.339	0.	0.
CHS	NGU	30.48	357.	1322400.	236048.	978358.	174637.	73.984	0.	0.
NGU	DOV	30.40	169.	1322400.	111743.	1307406.	110476.	98.866	21082.	249486.
TOTAL			733.	3967200.	484660.	3136584.	373173.	76.997	21082.	249486.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
NIP	0.	850820.	850820.	850820.	0.	0.
CHS	49560.	177098.	801260.	978358.	49560.	0.
NGU	705860.	1034908.	272498.	1307406.	394480.	311380.
DOV	1307406.	0.	0.	0.	1307406.	0.
TOTAL	2062826.	2062826.	1924578.	3136584.	1751446.	311380.

SEGMENT OPERATIONS SUMMARY

172 L-100

SEGMENT FROM	SEGMENT TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
SUU	NZY	30.40	498.	1322400.	329278.	1260321.	313820.	95.306	50398.	202401.
NZY	IND	30.40	1852.	1322400.	1224542.	1065582.	986729.	80.579	7095.	7662.
IND	NGU	30.40	588.	1322400.	388786.	1091462.	320890.	82.536	9861.	33542.
NGU	CHS	30.40	357.	1322400.	236048.	1021548.	182346.	77.250	0.	0.
CHS	NIP	30.40	207.	1322400.	136868.	969880.	100383.	73.342	0.	0.
TOTAL			3502.	6612000.	2315522.	5408793.	1904168.	82.235	67354.	243685.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
SUU	0.	1260321.	1260321.	1260321.	0.	0.
NZY	712420.	517681.	547901.	1065582.	656480.	55940.
IND	76240.	102120.	989342.	1091462.	76240.	0.
NGU	814922.	745008.	276540.	1021548.	509600.	305322.
CHS	80780.	29112.	940768.	969880.	80780.	0.
NIP	969880.	0.	0.	0.	606198.	363682.
TOTAL	2654242.	2654242.	4014872.	5408793.	1929298.	724944.

SEGMENT OPERATIONS SUMMARY

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SEGMENT FROM	TO	TRIPS	MILES	TOTAL AVAIL CABIN LOAD POUNDS	TOTAL AVAIL TON/MILES	TOTAL LIFT UTILIZED POUNDS	TOTAL TON/MILES MOVED	LOAD FACTOR ACHIEVED	TON/MILES OVERFLOWN UPON DEPARTURE	POUNDS OVERFLOWN UPON DEPARTURE
DOV	NGU	30.40	169.	1322400.	111743.	946372.	79968.	71.565	0.	0.
NGU	IND	30.40	588.	1322400.	388786.	1250482.	367642.	94.562	56613.	192562.
IND	NZY	30.40	1852.	1322400.	1224542.	1240564.	1148762.	93.812	169128.	182644.
NZY	SUU	30.40	498.	1322400.	329278.	1788956.	443458.	134.676	189836.	723836.
TOTAL			3107.	5289600.	2054348.	5218374.	2039830.	99.293	485778.	1098242.

TERMINAL	OFF LOAD POUNDS	ON LOAD POUNDS	THRU POUNDS	DEPART POUNDS	DELVY UNLOAD POUNDS	TRANSLOAD POUNDS
DOV	0.	946372.	946372.	946372.	0.	0.
NGU	615244.	919354.	331128.	1250482.	419828.	196224.
IND	89838.	79920.	1160644.	1240564.	89838.	0.
NZY	166688.	707068.	1073876.	1780956.	166688.	0.
SUU	1780956.	0.	0.	0.	1313954.	467002.
TOTAL	2652726.	2652726.	3512020.	5218374.	1989508.	663226.

AIRCRF REPORT

MANAGEMENT SUMMARY

ROUTE	STOPS	V/A TYPE	MILES TRAVELED	TON/MILES AVAILABLE	TON/MILES MOVED	LOAD FACTOR ACHVED	RATE PER MILE	TOTAL MILEAGE COST	LANDING FEES	TERMINAL COSTS	TOTAL COSTS	TON/MILES (AV) COST	TON/MILES (MV) COST
672	91	1	22283.	484660.	373173.	77.00	3.5324	78713.18	22750.		101463.	.209	.272
172	151	1	106461.	2315522.	1904168.	82.23	3.5324	376062.13	37750.		413812.	.179	.217
171	121	1	94453.	2054348.	2039830.	99.29	3.5324	333645.07	30250.		363895.	.177	.178
TOTAL	363.		223197.	4854530.	4317171.	88.93		788420.38	90750.		879170.	.181	.204

AIRCRAFT COST ADJUSTMENT FACTOR = .038,COST INCREASE = 33408.474, TOTAL AIRCRAFT COST = 912578.851

TRUCK REPORT

MANAGEMENT SUMMARY

ROUTE	STOPS	V/A TYPE	MILES TRAVELED	TON/MILES AVAILABLE	TON/MILES MOVED	LOAD FACTOR ACHVED	RATE PER MILE	TOTAL MILEAGE COST	LANDING FEES	TERMINAL COSTS	TOTAL COSTS	TON/MILES (AV) COST	TON/MILES (MV) COST
10	38	2	25155.	377325.	278038.	73.69	1.0769	27090.00	0.		27090.	.072	.097
11	25	2	16770.	251550.	222177.	88.32	1.0769	18060.00	0.		18060.	.072	.081
14	25	3	31566.	473495.	440793.	93.09	.8173	25800.00	0.		25800.	.054	.059
15	51	3	63133.	946989.	733282.	77.43	.8173	51600.00	0.		51600.	.054	.070
16	25	3	65609.	984141.	984140.	100.00	.7865	51600.00	0.		51600.	.052	.052
17	21	2	7711.	115668.	98259.	84.95	1.9608	15120.00	0.		15120.	.131	.154
18	21	2	7711.	115668.	79247.	68.51	1.9608	15120.00	0.		15120.	.131	.191
TOTAL	206.		217656.	3264836.	2835934.	86.86		204390.00	0.		204390.	.063	.072

MANAGEMENT SUMMARY

V/A TYPE	STOPS	MILES TRAVELED	TON/MILES AVAILABLE	TON/MILES MOVED	LOAD FACTOR ACHVED	RATE PER MILE	TOTAL MILEAGE COST	LANDING FEES	TERMINAL COSTS	TOTAL COSTS	TON/MILES (AV) COST	TON/MILES (MV) COST
L-100	363.	223197.	4854530.	4317171.	88.93	3.5324	788420.38	90750.		879170.	.181	.204
TRUCK	105.	57347.	860211.	677720.	78.79	1.9608	75390.00	0.		75390.	.088	.111
TRUCK	101.	160308.	2404625.	2158214.	89.75	.7865	129000.00	0.		129000.	.054	.060
									* 488833.*	33408.	(TAX ADJ)	
TOTAL	569.	440853.	8119366.	7153104.	88.10	2.2520	992810.38	90750.	488833.	1605802.	.198	.224

TOTAL POUNDS GENERATED = 9296044.00
TOTAL POUNDS SHIPPED = 11824068.00
TOTAL POUNDS DELIVERED = 8932362.00
TOTAL POUNDS TRANSLOADED = 2792274.00
TOTAL SYSTEM COST (IN DOLLARS) = 1605801.8506
TOTAL COST PER TON/MILE = .2245
TOTAL COST PER TON = 359.5470

20901	0.	902	0.	20903	0.	20904	0.
20905	0.	5020908	0.	910	0.	100911	0.
11100912	0.	20109	0.	209	0.	20389	0.
20509	0.	2050809	25200.	1009	0.	101109	0.
10111209	0.	1211	0.	102	0.	103	0.
20104	0.	20105	0.	5020106	0.	5020107	0.
5020108	0.	110	0.	111	0.	110112	0.
203	0.	204	0.	201	0.	205	0.
50206	0.	50207	0.	50208	0.	210	0.
211	0.	110212	0.	20301	0.	302	0.
304	0.	305	0.	50308	0.	311	0.
310	0.	110312	0.	401	0.	402	0.
20403	0.	405	0.	50406	0.	50408	0.
20410	0.	20411	0.	11020412	0.	501	0.
502	0.	20503	0.	504	0.	20510	0.
20511	0.	11020512	0.	50602	1508.	50701	3008.
50702	22500.	2050703	1500.	50704	1500.	2050710	10500.
2050711	1500.	50801	35280.	50802	95760.	2050803	2520.
50804	30240.	2050810	30240.	2050811	30240.	50812	7560.
21001	0.	1002	0.	1003	0.	1004	0.
1005	0.	51006	0.	51007	0.	51008	0.
1011	0.	111012	0.	21101	0.	50604	1500.
2050610	3000.	2050611	6000.	1102	0.	1103	0.
21104	0.	21105	0.	5021106	0.	51107	0.
51108	0.	1110	0.	1112	0.	2111201	0.
111202	0.	2111203	0.	2111204	0.	2111205	0.
111206	0.	111208	0.	111210	0.	10200000001	0.
10200000003	0.	10200000004	0.	10200000005	0.	10200050000	0.
500000008	36000.	11000000011	0.	11000110000	0.	1100000012	0.
10200000009	0.	10200000009	0.	10200000009	0.	10500020000	0.
200000009	0.	11000000009	0.	11100100000	0.	1000000009	0.
10200000004	0.	10200000005	0.	10200050000	0.	500000006	2044.
10200050000	0.	500000007	2044.	10200050000	0.	500000008	32704.
11100000012	0.	10500000006	18032.	10500000007	18032.	10500000008	87584.
11100000012	0.	10200000001	0.	10500000008	2220.	11100000012	0.
10200000003	0.	10500000006	9704.	10500000008	7278.	10200000010	0.
10200000011	0.	10200110000	0.	1100000012	0.	10200000003	0.
10200000010	0.	10200000011	0.	10200110000	0.	1100000012	0.
10500000002	0.	10500000001	0.	10500000002	0.	10500020000	0.
200000003	0.	10500000004	0.	10500020000	0.	200000010	0.
10500020000	0.	200000011	0.	10500000001	0.	10500000002	0.
10500020000	0.	200000003	0.	10500000004	0.	10500020000	0.
200000010	0.	10500020000	0.	200000011	0.	10500020000	0.
200110000	0.	11100000012	0.	10200000001	0.	10500000006	8220.
10500000007	10960.	10500000008	52060.	11100000012	0.	10200000001	0.
10500000004	0.	10500020000	0.	200000010	0.	10500020000	0.
200000011	0.	10200000004	0.	10200000005	0.	10200050000	0.
500000006	26640.	10500000007	2220.	10500000008	39960.	11100020000	0.
200000001	0.	11100000002	0.	11100020000	0.	200000003	0.
11100020000	0.	200000004	0.	11100020000	0.	200000005	0.
11100020000	0.	200050000	0.	10500000006	5320.	11100020000	0.
200050000	0.	10500000008	2660.	11100000010	0.